

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A system for assisting with the transfer of ~~transferring~~ semiconductor workpieces between a workpiece carrier having a carrier door and a processing tool having an interior area, comprising:

a frame including: having a first vertical strut and a second vertical strut each mounted to a lower support member providing a port door/carrier door storage compartment and plurality of mounting surfaces and an upper support member, said frame defining a perimeter of an I/O port;

an upper support member;

a lower support member having a first mounting surface and second mounting surface, said lower support member forming a port door/carrier door storage compartment between said first and second mounting surfaces for isolating a pod door and carrier door from the interior area of the processing tool;

a first vertical strut and a second vertical strut, each said vertical strut mounted to said upper support member and said first and second mounting surfaces of said lower support member;

an isolation plate having an opening, said isolation plate removably mounted to said first and second vertical struts, said isolation plate having an opening sized to allow such that a semiconductor workpiece may to travel unobstructed through said opening in said isolation plate and said I/O port;

a carrier advance assembly mounted to one of said plurality of mounting surfaces first mounting surface of said lower support member, said carrier advance assembly including an advance plate for supporting the wafer carrier and moving the wafer carrier between a first position and a second position; and

a port door assembly including a port door and a port door drive mechanism, being adapted to couple with the carrier door, said and a port door drive mechanism

~~mounted to said first vertical strut for moving said port door between said opening in said isolation plate and said port door/carrier door storage compartment; and~~
~~a workpiece handling robot for transferring the semiconductor workpieces between the workpiece carrier and the processing tool.~~

2. (Previously Amended) The system as recited in claim 1, wherein said second vertical strut includes a guide mechanism for movably guiding said port door between said opening in said isolation plate and said port door/carrier door storage compartment.

3. (Previously Canceled)

4. (Previously Amended) The system as recited in claim 1, wherein said isolation plate comprises a substantially transparent material.

5-7. (Previously Canceled)

8. (Currently Amended) An Equipment Front End Module (EFEM) system for assisting with the transfer of ~~transferring~~ semiconductor wafers between a wafer carrier having a carrier door and a processing tool having an interior region, comprising:

a frame including:

an upper support member;

a lower support member having a first mounting surface and second mounting surface, said lower support member forming a port door/carrier door storage compartment between said first and second mounting surfaces for isolating a pod door and carrier door from the interior area of the processing tool;

a plurality of vertical struts, each one of said plurality of vertical struts mounted to said upper support member and said first and second mounting surfaces of said lower support member;

~~having a first vertical strut and a second vertical strut each mounted to a lower support member and an upper support member, said lower support member providing a port door storage compartment and a plurality of mounting surfaces each adapted to receive a front end tool component, said frame defining an I/O port;~~

a carrier advance assembly mounted to ~~one of said plurality of mounting surfaces~~ said first mounting surface of said lower support member between each adjacent pair of said plurality of vertical struts, said carrier advance assembly ~~including an advance plate~~ for supporting the wafer carrier and moving the wafer carrier between a first position and a second position;

an isolation plate ~~having an opening, said isolation plate~~ removably mounted to each one of said first and second plurality of vertical struts, said isolation plate having a plurality of I/O ports;

a port door assembly including a port door ~~being adapted to couple/uncouple with the carrier door~~ and a port door drive mechanism, said port door drive mechanism for moving said port door between said opening in said isolation plate and said port door storage compartment.

9. (Previously Amended) The system as recited in claim 8, wherein said port door drive mechanism is affixed to said first vertical strut.

10. (Previously Amended) The system as recited in claim 8, further including a wafer handling robot mounted to one of said plurality of mounting surfaces of said lower support member.

11-12. (Previously Canceled)

13. (Currently Amended) An Equipment Front End Module (EFEM) system for transporting semiconductor wafers between a Front-Opening Unified Pod (FOUP) having a FOUP door and a processing tool having an interior area, comprising:

a frame ~~defining a perimeter of an I/O port~~, including:

an upper support member;

a lower support member having a first mounting surface and second mounting surface, said lower support member forming a storage compartment between said first and second mounting surfaces for isolating a pod door and FOUP door from the interior area of the processing tool;

a first vertical strut and a second vertical strut, each said vertical strut mounted to said upper support member and said first and second mounting surfaces of said lower support member;

an upper support member;

a lower support member providing an interior door storage compartment, an interior mounting surface, and an exterior mounting surface;

a first vertical strut and a second vertical strut, each said vertical strut affixed to said upper support member and said lower support member;

a FOUP advance assembly mounted to said ~~exterior~~ first mounting surface of said lower support member, said FOUP advance assembly ~~including a FOUP advance plate~~ for moving the FOUP between a first position and a second position;

a FOUP docking plate removably mounted to said first vertical strut and said second vertical strut, said FOUP docking plate ~~being substantially perpendicular to said FOUP advance plate and~~ having an opening so that wafers may pass through said FOUP docking plate; and

a port door ~~assembly including a port door~~ being adapted to couple/uncouple a with the FOUP door and ~~a port door drive mechanism for moving said port door travel~~ between said opening in said FOUP docking plate and said ~~interior door~~ storage compartment.

~~said vertical struts of said unified frame provide a common reference that said wafer engine, said SMIF pod advance assembly, and said SMIF pod docking plate may align with.~~

14. (Previously Canceled).

15. (Previously Amended) The system as recited in claim 13, wherein said FOUP docking plate comprises a substantially transparent material.

16. (Previously Added) The system as recited in claim 13, wherein said port door drive mechanism is affixed to said first vertical strut.

17. (Currently Amended) The system as recited in claim 1, ~~wherein said~~ further including a workpiece handling robot for transferring workpieces between the workpiece carrier and the process tool ~~is affixed to one of said plurality of mounting surfaces.~~
18. (New) The system as recited in claim 1, wherein said port door includes at least one latch key for coupling said port door to the carrier door.
19. (New) The system as recited in claim 8, wherein each one of said plurality of I/O ports is located between two of said plurality of vertical struts when said isolation plate is mounted to said plurality of vertical struts.
20. (New) The system as recited in claim 1, wherein said first vertical strut is substantially parallel to said second vertical strut.
21. (New) The system as recited in claim 1, wherein the carrier door is proximate to said port door when the workpiece carrier is moved into said second position by said carrier advance assembly.
22. (New) The system as recited in claim 1, wherein said port door drive mechanism is mounted to said first vertical strut.
23. (New) The system as recited in claim 1, wherein a workpiece carrier may be loaded onto said carrier advance assembly when said carrier advance assembly is located in said first position.
24. (New) The system as recited in claim 13, wherein said first vertical strut is substantially parallel to said second vertical strut.
25. (New) The system as recited in claim 13, wherein the FOUP door is proximate to said port door when the FOUP is moved into said second position by said FOUP advance assembly.
26. (New) The system as recited in claim 13, wherein said port door drive mechanism is mounted to said first vertical strut.
27. (New) The system as recited in claim 13, wherein a FOUP may be loaded onto said FOUP advance assembly when said FOUP advance assembly is located in said first position.